



Patent
Attorney's Docket No. 022701-831

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of)

Raymond DUBOUIS et al.)

Application No.: 09/331,959)

Filed: September 28, 1999)

For: USE OF MIXTURES WITH BASE)
OF PT AND OF TRANSITION)
METAL COMPOUNDS OTHER)
THAN PT FOR IMPROVING THE)
RESISTANCE TO ARC TRACKING)
AND TO ARC EROSION OF)
SILICON ELASTOMERS)

Group Art Unit: 1712

Examiner: Margaret G. Moore

Appeal No.

#24
3/28/02
11c

RECEIVED

MAR 21 2002

TC 1700

APPELLANTS' BRIEF ON APPEAL

Scott W. Cummings
BURNS, DOANE, SWECKER & MATHIS, L.L.P.
Post Office Box 1404
Alexandria, VA 22313-1404
(703) 836-6620

03/29/2002 YHDDLET 00000004 024800 09331959

01 FC:115 110.00 CH

03/29/2002 YHDDLET 00000001 024800 09331959

01 FC:120 320.00 CH



TABLE OF CONTENTS

I.	Introduction	1
II.	Real Party in Interest	1
III.	Related Appeals and Interferences	1
IV.	Status of Claims	1
V.	Status of Amendments	2
VI.	Summary of the Invention	2
VII.	The Issues	4
VIII.	Grouping of Claims	4
IX.	The §103(a) Rejection Over <i>Takita</i>	5
X.	The Argument	6
XI.	The §103(a) Rejection Over JP '644 in view of <i>Matsushita</i>	12
XII.	The Argument	14
XIII.	Conclusion	21

RECEIVED
MAR 21 2002
TC 1700

I. Introduction

This appeal is from the decision of the Primary Examiner dated September 25, 2001 (Paper No. 18), finally rejecting claims 1-21, which are reproduced as an Appendix to this brief.

Two extra copies of this brief are being filed herewith.

The Commissioner is hereby authorized to charge \$310.00 (120) Government fee and any other appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800. This paper is submitted in triplicate.

II. Real Party in Interest

The present application is assigned to Rhodia Chimie, located at 25, Qua Paul Doumer, F-92408 Courbevoie Cedex, France.

III. Related Appeals and Interferences

The Appellants' legal representative, or assignee does not know of any other appeals or interferences that will affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

IV. Status of Claims

Claims 1-21 are pending. All of these claims are the subject of the present appeal. A clean copy of the appealed claims is set forth in the attached Appendix.

V. Status of Amendments

An Amendment After Final Rejection was filed in the U.S. Patent and Trademark Office on December 18, 2001. The Advisory Action of January 9, 2002, states that the amendments proposed in the December 18, 2001, Amendment After Final Rejection would be entered upon timely receipt of a Notice of Appeal and Appeal Brief with requisite fees. Accordingly, the version of claim 14, presented in the attached Appendix, incorporates the amendments presented in the December 18, 2001, Amendment After Final Rejection.

In addition, a Supplemental Amendment After Final Rejection was filed on February 19, 2002, to obviate the §112 rejection of claim 15. The Advisory Action of February 26, 2002, states that the amendment to claim 15 has been entered and that the §112 rejection of claim 15 has been withdrawn. Accordingly, the version of claim 15, presented in the attached Appendix, incorporates the amendment presented in the Supplemental Amendment of February 19.

VI. Summary of the Invention

The present invention relates to the use of mixtures based on platinum and compounds based on transition metals other than platinum, as additives for enhancing the arc-tracking and arc-erosion resistance properties of silicone elastomers. In particular, the present invention is directed to using such mixtures as additives for enhancing arc-tracking and arc-erosion resistance properties of silicone elastomers.

The elastomers of the presently claimed invention exhibit enhanced arc-tracking and arc-erosion resistance properties, as well as good flame-resistance properties and good mechanical properties. Accordingly, elastomers of the presently claimed invention can be used in any application in which polyorganosiloxane elastomers that are resistant to flame and/or that are capable of withstanding leakage currents and electric arcs may be desirable. For example, the elastomers of the presently claimed invention may be especially suitable for use in electric insulating materials, medium voltage and high-voltage insulators, cable termination accessories, cable joints, anode caps for television tubes and molded objects or extrudent articles for the aeronautics industry. See specification at page 23, lines 13-25.

Although it is known to use mixtures of platinum and mixed iron oxide (of formula $(\text{FeO})_x (\text{Fe}_2\text{O}_3)_y$) and platinum with at least one rare-earth metal oxide, such as, for example, a mixture of platinum with cerium (IV) oxide, to enhance flame-resistance properties of silicone elastomers, until now, no one has discovered the advantage of using the composition of the presently claimed invention. That is, until now no one has discovered the advantage of using a composition comprising a mixture of A (platinum and FeO and Fe_2O_3), B (platinum and cerium (IV) oxide and/or hydroxide and/or platinum and cerium (IV) oxide and/or hydroxide and titanium oxide) or C (platinum and cerium (IV) oxide and/or hydroxide and titanium oxide and FeO and Fe_2O_3) in specified ratios in a polyorganosiloxane composition comprising an alkenylsilyl group-carrying constituent and a hydrosilyo group-carrying constituent, either crosslinkable at room temperature or with

the heat of polyaddition reactions, to enhance arc-tracking and arc-erosion resistance properties. See, for example, independent claim 1.

VII. The Issues

Whether claims 1-21, all of the claims on appeal, were improperly rejected under 35 U.S.C. §103(a) as being obvious over *Takita* (U.S. Patent No. 5,543,450) and over Japanese Patent Publication 50-97644 (hereinafter after "JP '644") in view of *Matsushita* (U.S. Patent No. 4,110,300).

VIII. Grouping of Claims

The claims on appeal do not stand or fall together. For convenience in handling of this appeal, the claims will be grouped and argued as follows:

Group I: Claims 1-10, 12-15, 16, 18 and 20

Group II: Claims 11, 17, 19 and 21.

Thus, pursuant to 37 C.F.R. §1.192(c)(7) in this appeal, the rejected claims of Group II do not stand or fall with the rejections of Group I. Reasons for the separate patentability of the claims of Group II are given below.

IX. The §103(a) Rejection Over *Takita*

A. Rejection of the Claims Under 35 U.S.C. §103(a) over *Takita*

1. *The Reference*

Takita relates to the use of polyorganosiloxane materials having a composition which is crosslinkable with organic peroxides at elevated temperatures. See, for example, *Takita* at column 4, line 60 and column 6, lines 28-33. Further, *Takita* discloses that when organopolysiloxanes of component (1) possess at least two alkenyl groups, organohydrogen polysiloxanes having at least two hydrogen atoms bound to silicon atoms may be used as a cross-linking agent. See *Takita* at column 5, lines 3-7.

2. *The Examiner's Rationale*

In the Official Action of September 25, 2001, the Examiner maintained the rejection of claims 1-21 under 35 U.S.C. §103(a) as being unpatentable over *Takita*. In that Official Action, the Examiner stated as follows:

Applicants' have amended claim 1 such that component D requires a hydrosilyl group containing component. The obviousness of such a component has previously been addressed. For instance see paragraph 7 of the office action dated March 31, 2000, as it applied then to claims 4 to 7 and 10. Applicant's response that *Takita et al.* fail to disclose the polyorganosiloxane composition D, but it acknowledges the teachings in *Takita et al.* that a hydrosilyl group containing component can be used as a crosslinking agent with an alkenylsilyl group component. Thus one having ordinary skill in the art would have found a silicone rubber composition containing the claimed components in (D) to have been obvious over the teachings of *Takita et al.*, particularly noting column 5, lines 3 to 10.

Further, paragraph 7 of the Official Action dated March 31, 2000, as referenced in the above paragraph of the September 25, 2001, Official Action, stated as follows:

While *Takita et al.* do not exemplify a composition cured with an SiH containing siloxane, they are disclosed on the top of column 5. Note that the viscosity ranges taught on the top of column 3 includes the viscosities of claims 4 to 7 and as such renders obvious the compositions in these claims. With regards to claim 10, again note that while these specific articles are not taught by *Takita et al.*, they are common and obvious uses for the silicone composition and articles formed therefrom taught therein. The skilled artisan would have found such articles obvious over that which is known in the art (i.e. the common uses for silicone rubbers) and the teachings of *Takita et al.*

B. Restatement of the Issue

The issue that the Board should address is whether the teachings of *Takita* fail to render the claimed invention *prima facie* obvious to one of ordinary skill in the art.

X. The Argument

A. The Claimed Invention as a Whole Would Not Have Been Obvious to One of Ordinary Skill in the Art at the Time the Invention Was Made.

As explained in the Amendment filed on July 13, 2001, claim 1 of the present application defines a composition including a polyorganosiloxane composition D comprising an alkenylsilyl group-carrying constituent and hydrosilyl group-carrying substituent. The composition D being crosslinkable at room temperature or with heat from polyaddition reactions in the presence of a platinum catalyst by reactions between alkenylsilyl and hydrosilyl group. See Amendment of July 13, 2001, at pages 20-21.

1. *Group I (Claims 1-10, 12-15, 16, 18 and 20)*

In contrast to the presently claimed invention, *Takita* teaches using polyorganosiloxane materials having a composition which is crosslinkable with organic peroxides at elevated temperatures (See, for example, column 4, line 60 and column 6, lines 28-33). Further, *Takita et al.* discloses that when organopolysiloxanes of component (1) possesses at least two alkenyl groups, an organohydrogen polysiloxane having at least two hydrogen atoms bound to silicon atoms may be used a cross-linking agent. See *Takita* at column 5, lines 3-7. However, *Takita et al.* fails to disclose or suggest the polyorganosiloxane composition D as defined by claim 1. That is, *Takita* neither discloses nor suggests the composition of independent claim 1:

an effective amount of a mixture A, B or C formed from:
in regard to mixture A, constituents A1 + A3 where constituent A1 is platinum in the form of a platinum complex or compound and constituent A3 consists of a combination of FeO and Fe₂O₃;
in regard to mixture B, mixture B consisting of at least one of: constituents B1 + B2 where constituent B1 has the meaning of constituent A1 and constituent B2 comprises cerium (IV) oxide and/or hydroxide; and constituents B1 + B3 where constituent B1 has the meaning of constituent A1 and constituent B3 has the meaning of a combination of cerium (IV) oxide and/or hydroxide and titanium oxide TiO₂; or
in regard to mixture C, constituents C1 + C2 where constituent C1 has the meaning of constituent A1 and constituent C2 consists of a combination of constituent B3 and constituent A3;
in constituent A3, the ratio of the amount by weight of FeO to that of Fe₂O₃ lies within the range going from 0.1:1 to 9:1;

in constituent B3, the ratio of the amount by weight of cerium (IV) oxide and/or hydroxide to that of TiO_2 lies within the range going from 0.6:1 to 6:1;

in constituent C2, the ratio of the amount by weight of constituent A3 to that of constituent B3 lies within the range going from 0.02:1 to 1:1;

in a polyorganosiloxane composition D comprising an alkenylsilyl group-carrying constituent and a hydrosilyl group-carrying constituent, either crosslinkable at room temperature or with the heat from polyaddition reactions in the presence of a platinum catalyst by reactions between the alkenylsilyl and hydrosilyl groups; and

the amounts of the various constituents A1, A3, B1, B2, B3, C1 and C2 lie within the ranges mentioned below;

Thus, *Takita et al.* fails to render obvious the composition of the presently claimed invention as set forth, for example, in independent claims 1, 16, 18 and 20.

2. *Group II (Claims 11, 17, 19 and 21)*

Furthermore, with respect to dependent claims 11, 17, 19 and 21, directed to methods of enhancing the arc-tracking and arc-erosion resistance properties in an article, comprising incorporating an effective amount of the composition of the presently claimed invention into said article, nowhere does *Takita* disclose or even suggest such a method. That is, nowhere does *Takita* disclose or even suggest the possibility of using a composition required by the presently claimed invention for the purpose of enhancing arc-tracking and arc-erosion resistance properties of an article. That is, nowhere does *Takita* disclose or suggest enhancing the arc-tracking and arc-resistance properties of an article by

incorporating an effective amount of the claimed composition into said article as set forth, for example, in claim 11.

For at least these reasons, the presently claimed invention would not have been obvious over *Takita*. Accordingly, the rejection of the claims under 35 U.S.C. §103(a) over *Takita* should be withdrawn.

B. Unexpected Results May Rebut A Prima Facie Showing of Obviousness

Furthermore, as stated by the Federal Circuit, evidence rising out of the so-called secondary considerations must always, when present, be considered en route to a determination of obviousness. Indeed, evidence of secondary considerations can often be the most probative and cogent evidence in the record. It can often establish that an invention appearing to have been obvious in light of the prior art was not. *Stratoflex, Inc. v. Aeroquip Corp.*, 218 USPQ 871, 879 (Fed. Cir. 1983); *Joy Technologies v. Quigg*, USPQ2d 1432, 1442 (D.D.C. 1990).

In addition, Appellants submit that while the Examiner appears to believe that the advantages of the presently claimed are not sufficient to overcome the rejections of record, the Examiner does not appear to have provided reasons to support this position. Thus, Appellants submit that because the statements of advantages provided in the specification and in Applicants' Amendments have not been questioned by the Examiner, the statements must be accepted at face value, and the claims must be allowed. *In re Soni*, 746, 751, 34 USPQ2d 1684, 1688 (Fed. Cir. 1995).

In the present case, there is certainly no appreciation in *Takita* of the unexpected and beneficial properties that are obtained by the composition and method of claims 1, 16, 18 and 20 and 11, 17, 19 and 21, respectively. In fact, the present specification explains that although mixtures of platinum with mixed iron oxide and with at least one rare-earth metal oxide have been used to enhance flame-resistance properties of silicone elastomers, until now no one has used a composition or method similar to those of the presently claimed invention to enhance arc-tracking and arc-erosion resistance properties. See specification at page 2. More specifically, Tables ~~I~~ and II show that elastomeric compositions of the presently claimed invention exhibit arc-induced weight losses that are surprisingly and unexpectedly superior to conventional elastomeric compositions (i.e. control compositions). For example, the results of Tables I and II show that compositions of the presently claimed invention exhibit an arc-induced weight loss in mg, that is 1.85-4.7 times less than the arc-induced weight loss of the control compositions.

C. Failure to Consider the Invention as a Whole

In addition, Appellants submit that because *Takita* fails to even consider the problem of poor arc-resistance and fails to propose any means for addressing this problem, the presently claimed invention would not have been obvious over *Takita*.

That is, while the presently claimed composition and method can provide surprisingly and unexpectedly superior arc-resistance properties, *Takita* fails to disclose or even suggest that the disclosed composition should, or even could, be used to enhance arc-

resistance properties. Instead, the only properties *Takita* discloses enhancing are nonflammability and toxicity. See *Takita* at col. 1, lines 5-10.

Thus, because *Takita* is entirely unrelated to the enhancement of arc-resistance properties, Appellants respectfully submit that the composition and method of the presently claimed invention would not have been obvious over *Takita*.

D. Summary

In view of the above, Appellants respectfully submit that the composition and methods of the presently claimed invention are substantially different from the invention of *Takita*. In view of *Takita*'s failure to disclose or suggest the claimed composition or method or the surprising and unexpected arc-resistance properties they provide, *Takita* fails to render obvious Appellants' invention.

For at least these reasons, *Takita* fails to obviate patentability of the claimed invention. Accordingly, the rejection of claims 1-21 under 35 U.S.C. §103(a) over *Takita* should be withdrawn.

XI. The §103(a) Rejection Over JP '644 in View of *Matsushita*

A. Rejection of the Claims Under 35 U.S.C. §103(a) Over Japanese Laid-Open Patent Publication No. 50-97644 (hereinafter JP '644) in View of *Matsushita* (U.S. Patent No. 4,110,300)

1. *The References*

JP '644 relates to a self-extinguishing silicone rubber composition. In particular, JP '644 relates to a self-extinguishing silicone rubber composition that is stable with regard to heat and humidity. See the English-language translation of JP '644 at page 2, first full paragraph of "Detailed explanation of the invention." The self-extinguishing silicone rubber composition of JP '644 comprises diorganopolysiloxane rubber, reinforcing filler silica, organic peroxide, platinum compound and iron oxide. See JP '644 at page 2, lines 1 through 11. The object of JP '644 is to provide a silicone rubber compound that eliminates the problems of the prior art, that is not easily affected by heat or moisture and that has excellent self-extinguishing properties. See JP '644 at page 3, lines 4-6.

Matsushita relates to an improved self-extinguishing silicone rubber composition. See *Matsushita* at column 1, lines 1 to 2. In particular, the silicone rubber composition of *Matsushita* comprises organopolysiloxane, finely powdered silica, platinum, finely powdered γ -type iron sesquioxide. See *Matsushita* at column 1, line 60 to column 2, line 15. The object of *Matsushita* is to provide self-extinguishing silicone rubber compositions that are free from the deficiencies of the prior art and capable of producing molded articles having excellent mechanical strength and heat resisting properties. See *Matsushita* at column 1, lines 55 to 59.

2. *The Examiner's Rationale*

In the Official Action of September 25, 2001, the Examiner maintained the rejection of claims 1 to 21 under 35 U.S.C. §103(a) as being unpatentable over JP '644 in view of *Matsushita*. In that Official Action, the Examiner stated as follows:

This rejection relies on the relational detailed in paragraph 6 of the previous office action. As noted, *Matsushita* indicate the alternative and equivalent use of silicone rubbers which cure via an SiH/platinum catalyst cure mechanism and a peroxide cure mechanism. One having ordinary skill in the art would have been motivated by the teachings of *Matsushita* to use silicone rubber forming components such as those found in claims 4 to 7 in the silicone rubber forming composition of '644 with a reasonable expectation of success.

Further, in paragraph 6 of the previous Official Action, (i.e., the Official Action dated March 13, 2001), the Examiner stated as follows:

Matsushita teaches a silicone rubber composition which is an improvement over '644. This reference teaches that either peroxide cured gums can be used, or lower viscosity siloxanes that crosslink through SiH components in the presence of a catalytically effective amount of a Pt catalyst. See for instance Example 1 and 2, which peroxide polymerize silicone "rubbers", similar to that used in '644, and Example 3, which uses a lower viscosity siloxane in an addition reaction. Note too column 2, which teaches the vinyl containing siloxane, and the bottom of column 4 through column 5, which teaches the alternative use of peroxide and SiH/platinum curing compositions. Both compositions are used to form silicone rubber end products, and thus *Matsushita* indicates that such compositions can be used alternatively and equivalently in the formation of self-extinguishing silicone rubbers.

B. Restatement of the Issue

The issue that the Board should address is whether the teachings of JP '644 in view of *Matsushita* would have failed to render the claimed invention *prima facie* obvious to one of skill in the art.

XII. The Argument

A. There is No Motivation to Combine JP '644 and *Matsushita* as Suggested in the Official Action.

In establishing a *prima facie* case of obviousness under 35 U.S.C. §103, it is incumbent upon the Examiner to provide reasons *why* one skilled of ordinary skill in the art would have been led to modify a prior art reference to combine reference teachings to arrive at the composition or method of the presently claimed invention. To this end, the requisite motivation must stem from some teaching, suggestion of inference in the prior art as a whole or from the knowledge generally available to one of ordinary skill in the art and not from Appellants' disclosure. *Ex parte Nesbit*, 25 USPQ 2d 1817, 1819 (BPAI 1992); *In re Oetiker*, 24 USPQ 2d 1443, 1446 (Fed. Cir. 1992). The mere fact that the prior art can be modified does not make such modification obvious unless the prior art suggests the desirability of the modification. *In re Gordon*, 221 USPQ 1125, 1127 (Fed. Cir. 1984). There must be some intrinsic basis in the prior art or some extrinsic factor that would prompt one of ordinary skill in the art to combine the teachings of the references; otherwise, the Patent Office's burden of establishing a *prima facie* case of obviousness has not been established. Moreover, the determination of whether some reason, suggestion or

motivation existed for making the combination must be made from the viewpoint of the hypothetical person of ordinary skill *in the field of the invention* (emphasis added). *In re Oetiker*, 24 USPQ 2d 1443, 1446 (Fed. Cir. 1992); *In re Raines*, 28 USPQ 2d 1630, 1631 (Fed. Cir. 1993).

In the present case, no such factors or motivation for combining JP '644 and *Matsushita* exists. In fact, in this case, there is an explicit teaching away from combining JP '644 and *Matsushita*. That is, as explained at length in the Amendments filed on December 18, 2001, and July 13, 2001, *Matsushita* is directed to self-extinguishing silicone rubber compositions, but explicitly teaches away from the composition disclosed in JP '644. In particular, *Matsushita* specifically addresses the undesirability of the composition of JP '644 stating

... and Japanese Laid-open Publication Number 50-97644 discloses $(\text{FeO})_x(\text{Fe}_2\text{O}_3)_y$ where the ratio between small x and small y is in the range of 0.05 to 1.0)... The product obtained by adding a platinum compound and $(\text{FeO})_x(\text{Fe}_2\text{O}_3)_y$ is disadvantageous in that if the amount of $(\text{FeO})_x(\text{Fe}_2\text{O}_3)_y$ is not large, the resulting self-extinguishing properties will be unsatisfactory, whereas if the amount of $(\text{FeO})_x(\text{Fe}_2\text{O}_3)_y$ is increased, the mechanical properties of the resulting product silicone elastomer will be deteriorated. See *Matsushita* at column 1, lines 27 to 30 and 46 to 42.

Thus, *Matsushita* expressly teaches that substitution of the particular iron oxide of JP '644 would produce a composition that would exhibit undesirable properties. More specifically, *Matsushita* clearly and explicitly discloses that to avoid obtaining such a composition, the disclosed composition must include a gamma-type iron oxide instead of the $(\text{FeO})_x(\text{Fe}_2\text{O}_3)_y$ (iron oxide of JP '644). See *Matsushita* at column 3, lines 16 to 40.

Thus, in view of the explicit teachings of *Matsushita*, Appellants submit that no person of ordinary skill in the art would have been motivated to combine JP '644 with *Matsushita* to obtain the composition of claims 1, 16, 18 or 21. Furthermore, in addition to failing to disclose or suggest the compositions of claims 1, 16, 18 or 21, Appellants submit that neither JP '644 nor *Matsushita* disclose or suggest any method whatsoever for enhancing arc-resistance properties, let alone the methods of claims 11, 17, 19 or 21.

In view of the above, Appellants contend that there would be no basis absent the impermissible use of hindsight based on Appellants' disclosure, for combining the references as suggested in the Official Action.

That is, the Official Action has not shown any motivation why one of ordinary skill in the art would have looked to the varying teachings of the references, and combined those teachings to obtain the presently claimed invention in spite of the specific teachings of *Matsushita* to avoid such a combination. Clearly, the motivation for doing so can only come from the teachings of the present specification, which teaches the desirability of the claimed composition and method to enhance arc-resistance properties. However, the teaching, suggestion or motivation for combining the cited references "cannot come from the applicant's invention itself." *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). That is, the motivation for combining the references cannot be a product of hindsight reconstruction of the claimed invention based on Appellants' own disclosure.

Such a hindsight reconstruction has clearly been made in the Official Action. The Official Action asserts that the claimed invention would have been obvious based on a

hindsight selection of claimed elements, as evidenced by the contrary teachings of the cited references, which would only suggest to one skilled in the art that the teachings should not be combined and then modified to obtain the claimed invention. Such a combination is improper because the references, viewed by themselves and not in retrospect, must suggest the combination asserted by the Office Action. *In re Shaffer*, 229 F.2d 476, 108 USPQ 326 (C.C.P.A. 1956); *In re Stoll*, 523 F.2d 1392, 187 USPQ 481 (C.C.P.A. 1975). Here the references do not provide any motivation for combining the different elements of the references to obtain the presently claimed compositions and methods. Instead, as previously explained, *Matsushita* explicitly teaches against combining the references. The only motivation for ignoring this explicit teaching derives from the disclosure of the present application, which is clearly improper.

B. The Claimed Invention As A Whole Would Not Have Been Obvious To One Of Ordinary Skill In The Art At The Time The Invention Was Made

For example, in view of the above remarks, Appellants respectfully submit that if one of ordinary skill in the art were to objectively apply the teachings of *Matsushita* to the teachings of JP '644, one would clearly come away with the understanding that the gamma-type iron oxide additive of *Matsushita* must be substituted for the $(\text{FeO})_x(\text{Fe}_2\text{O}_3)_y$ (iron oxide) additive disclosed in JP '644. However, substitution of the gamma-type iron oxide additive of *Matsushita* would not have resulted in the presently claimed invention as defined, for example, in independent claim 1. In fact, as the Examiner already

acknowledged, the iron-type oxide additive of *Matsushita* does not satisfy the recited iron oxide additive of claim 1. See the March 31, 2000, Official Action at page 5, lines 3-7.

Thus, as the Examiner has admitted, even if the references were combined in the manner suggested in the Official Action, neither the composition of claims 1, 16, 18 and 20 nor the methods of claims 11, 17, 19 and 21 would be achieved. Even if the documents were properly combinable in the manner suggested by the Examiner, one of ordinary skill in the art would still not arrive at the presently claimed invention.

C. Unexpected Results May Rebut A Prima Facie
Showing of Obviousness

Furthermore, as explained above, evidence rising out of the so-called secondary considerations must always, when present, be considered en route to a determination of obviousness.

In addition, Appellants submit that while the Examiner appears to find the advantages of the presently claimed invention insufficient to overcome the outstanding rejections, the Examiner has provided no basis to support this position. Accordingly, Appellants submit that because the Examiner has failed to question the statements of advantages explicitly and implicitly provided in Appellants' specification and Amendments, these statements must be accepted at face value and the claims must be allowed. *In re Soni*, at 751.

In the present case, there is certainly no appreciation in either JP '644 or *Matsushita* of the unexpected and beneficial properties obtained by the presently claimed composition

and method. For example, Tables I and II of the specification show that elastomeric compositions of the presently claimed invention surprisingly and unexpectedly exhibit arc-induced weight losses that are 1.85-4.7 times less than arc-induced weight losses exhibited by conventional (control) compositions. See Tables I and II at pages 27 and 34 of the specification.

D. Failure to Consider the Invention as a Whole

In addition, Appellants submit that because JP '644 and *Matsushita* fail to even consider the problem of poor arc-resistance and fail to propose any means for addressing this problem, the presently claimed invention would not have been obvious over JP'644 in view of *Matsushita*.

That is, nowhere do JP '644 or *Matsushita* disclose or suggest that a composition or method, similar to those of the presently claimed invention, should, or even could, be used to enhance arc-resistance properties. Instead, JP '644 and *Matsushita* only disclose enhancing self-extinguishing properties to prevent risk of fire.

Because JP '644 and *Matsushita* are entirely unrelated to the enhancement of arc-resistance properties, Appellants respectfully submit that the composition and method of the presently claimed invention would not have been obvious over JP '644, either alone or in combination with *Matsushita*.

E. Summary

In view of the above, Appellants respectfully submit that the compositions of claims 1, 16, 18 and 20 and the methods of using those compositions to enhance arc-resistance properties as set forth in claims 11, 17, 19 and 21 are significantly different from that of JP '644 in view of *Matsushita*. That is, in view of the explicit teaching of *Matsushita* that the disclosed composition must include a γ -type iron oxide instead of a $(\text{FeO})_x(\text{Fe}_2\text{O}_3)_y$, Applicants respectfully submit that no person of ordinary skill in the art would have been motivated to combine the teachings of *Matsushita* and JP '644 to arrive at the presently claimed invention. In addition, absent any appreciation in JP '644 or *Matsushita* of the surprising and unexpected arc-resistance properties obtained by the presently claimed invention, Appellants submit that the claimed invention would not have been obvious over the above references.

The combination of references, therefore, fails to obviate the patentability of the claimed invention. Accordingly, the rejection of the claims under 35 U.S.C. §103(a) over JP '644 in view of *Matsushita* should be withdrawn.

XIII. Conclusion

In view of the foregoing, Appellants respectfully submit that the claimed invention would not have been obvious at the time the invention was made to a person having ordinary skill in the art. Accordingly, reversal of the Examiner's rejections are earnestly solicited.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: Martin Buels Reg. No. 45,635
for: Scott W. Cummings
Registration No. 41,567

P.O. Box 1404
Alexandria, Virginia 22313-1404

Date: March 18, 2002

APPENDIX

1. A composition for enhancing the arc-tracking and arc-erosion resistance properties of an article comprising:

an effective amount of a mixture A, B or C formed from:

in regard to mixture A, constituents A1 + A3 where constituent A1 is platinum in the form of a platinum complex or compound and constituent A3 consists of a combination of FeO and Fe₂O₃;

in regard to mixture B, mixture B consisting of at least one of: constituents B1 + B2 where constituent B1 has the meaning of constituent A1 and constituent B2 comprises cerium (IV) oxide and/or hydroxide; and

constituents B1 + B3 where constituent B1 has the meaning of constituent A1 and constituent B3 has the meaning of a combination of cerium (IV) oxide and/or hydroxide and titanium oxide TiO₂; or

in regard to mixture C, constituents C1 + C2 where constituent C1 has the meaning of constituent A1 and constituent C2 consists of a combination of constituent B3 and constituent A3;

in constituent A3, the ratio of the amount by weight of FeO to that of Fe₂O₃ lies within the range going from 0.1:1 to 9:1;

in constituent B3, the ratio of the amount by weight of cerium (IV) oxide and/or hydroxide to that of TiO₂ lies within the range going from 0.6:1 to 6:1;

in constituent C2, the ratio of the amount by weight of constituent A3 to that of constituent B3 lies within the range going from 0.02:1 to 1:1;

in a polyorganosiloxane composition D comprising an alkenylsilyl group-carrying constituent and a hydrosilyl group-carrying constituent, either crosslinkable at room temperature or with the heat from polyaddition reactions in the presence of a platinum catalyst by reactions between the alkenylsilyl and hydrosilyl groups; and the amounts of the various constituents A1, A3, B1, B2, B3, C1 and C2 lie within the ranges mentioned below;

the amount of platinum, expressed in parts by weight of elemental platinum, lies within the range going from 1 to 250 ppm with respect to the total weight of the polyorganosiloxane constituent(s) of the curable compositions D; and

the amounts of constituents A3, B2, B3 and C2 of mixtures A, B and C, expressed in parts by weight of the constituent, lie within the range going from 0.5 to 30 parts by weight per 100 parts of the polyorganosiloxane constituent(s) of the curable compositions D.

2. The method according to claim 11, wherein the curable polyorganosiloxane compositions D, presented as one or more packages, contain a main constituent formed from one or more polyorganosiloxane constituents, and a suitable catalyst.

3. The method according to claim 2, wherein the polyorganosiloxane consist of siloxyl units of general formula:



and/or siloxyl units of formula:



in which formulae the various symbols have the following meaning:

- the symbols R, which are identical or different, each represent a non-hydrolysable hydrocarbon-type group defined as:

- * alkyl and haloalkyl radicals having from 1 to 5 carbon atoms and containing from 1 to 6 chlorine and/or fluorine atoms;
- * cycloalkyl and halocycloalkyl radicals having from 3 to 8 carbon atoms and containing from 1 to 4 chlorine and/or fluorine atoms;
- * aryl, alkylaryl and haloaryl radicals having from 6 to 8 carbon atoms and containing from 1 to 4 chlorine and/or fluorine atoms; or
- * cyanoalkyl radicals having from 3 to 4 carbon atoms;

- the symbols Z each represent a hydrogen atom or a C₂-C₆ alkenyl group;

- n = an integer equal to 0, 1, 2 or 3;

- x = an integer equal to 0, 1, 2 or 3;
- y = an integer equal to 0, 1 or 2;
- the sum $x + y$ lies within the range going from 1 to 3.

4. The method according to claim 2, wherein the polyorganosiloxane compositions D are those one-component or two-component compositions crosslinkable at room temperature or with heat from polyaddition reactions, called RTV compositions, which comprise:

- (a) 100 parts by weight of at least one polydiorganosiloxane comprising linear homopolymers or copolymers having at least 2 vinyl groups per molecule, these vinyl groups being linked to different silicon atoms and located in the chain and/or at the chain ends, the other organic radicals of which, linked to the silicon atoms, are chosen from methyl, ethyl and phenyl radicals, at least 60 mol% of these other radicals being methyl radicals, and having a viscosity ranging from 400 to 100,000 mPa.s at 25°C;
- (b) at least one polyorganohydrosiloxane chosen from linear or cyclic homopolymers and copolymers having at least 2 hydrogen atoms per molecule, these hydrogen atoms being linked to different silicon atoms and the organic radicals of which, linked to the silicon atoms, are chosen from methyl, ethyl and phenyl radicals, at least 60 mol% of these radicals being methyl radicals, and having a viscosity ranging from 5 to 1000 mPa.s at 25°C, reactant (b) being used in an amount such that the molar ratio of the hydride functional groups of (b) to the vinyl groups of (a) is between 1.1 and 4;
- (c) a catalytically effective amount of a platinum catalyst;
- (d) 0 to 120 part(s) by weight of siliceous filler(s) per 100 parts by weight of the combination of polyorganosiloxanes (a) + (b).

5. The method according to claim 4, wherein up to 100% by weight of reactant (a) is replaced with a polyorganosiloxane resin containing from 0.1 to 20% by weight of one or more vinyl groups in its structure, said structure having at least two different units

chosen from M (triorganosiloxy), D (diorganosiloxy), T (monoorganosiloxy) and Q ($\text{SiO}_{4/2}$) units, at least one of these units being a T or Q unit.

6. The method according to claim 2, wherein the polyorganosiloxane compositions D comprise one-component or two-component compositions crosslinkable with heat from polyaddition reactions, and comprising at least one vinyl-containing polydiorganosiloxane reactant (a), the viscosity of the vinyl-containing polydiorganosiloxane reactant (a) lies within the range going from a value greater than 100,000 mPa.s to 500,000 mPa.s.

7. The method according to claim 2, wherein the polyorganosiloxane compositions D are those one-component or two-component compositions crosslinkable with heat from polyaddition reactions, called polyaddition EVC compositions, which comprise:

- (a') 100 parts by weight of polydiorganosiloxane gum which is a linear homopolymer or copolymer having at least 2 vinyl groups per molecule, these vinyl groups being linked to different silicon atoms and located in the chain and/or at the chain ends, the other organic radicals of which, linked to the silicon atoms, are chosen from methyl, ethyl and phenyl radicals, at least 60 mol% of these other radicals being methyl radicals, and the said gum having a viscosity of greater than 500,000 mPa.s at 25°C;
- (b') at least one polyorganohydrosiloxane chosen from linear, cyclic or network homopolymers and copolymers having at least 3 hydrogen atoms per molecule, these hydrogen atoms being linked to different silicon atoms, and the organic radicals of which, linked to the silicon atoms, are chosen from methyl, ethyl and phenyl radicals, at least 60 mol% of these radicals being methyl radicals, and having a viscosity ranging from 5 to 1000 mPa.s at 25°C, reactant (b') being used in an amount such that the molar ratio of the hydride functional groups of (b') to the vinyl groups of (a') is between 0.4 and 10;
- (c') a catalytically effective amount of a platinum catalyst;

- (d') 0.5 to 120 parts by weight of siliceous filler(s) per 100 parts by weight of the combination of polyorganosiloxanes (a') + (b').

8. The method according to claim 2 wherein the polyorganosiloxane compositions D are those one-component compositions, called EVC compositions, comprising:

- (a'') 100 parts by weight of a polydiorganosiloxane gum which is a linear homopolymer or copolymer having at least 2 vinyl groups per molecule, these vinyl groups being linked to different silicon atoms and located in the chain and/or at the chain ends, the other organic radicals of which, linked to the silicon atoms, are chosen from methyl, ethyl and phenyl radicals, at least 60 mol% of these other radicals being methyl radicals, and the said gum having a viscosity of at least 1,000,000 mPa.s at 25°C;
- (b'') 0.1 to 7 parts by weight of an organic peroxide; (c'') 0.5 to 120 parts by weight of siliceous filler(s) per 100 parts by weight of gum (a'').

9. Articles made of silicone elastomer having good arc-tracking and arc-erosion resistance properties, and good flame-resistance properties and good mechanical properties, which are obtained by crosslinking:

- polyorganosiloxane compositions D as defined in claim 1.

10. Articles according to claim 9, which comprise electrical insulation materials, medium-voltage and high-voltage insulators, cable termination accessories, cable joints, anode caps for television tubes and moulded objects or extruded articles for the aeronautics industry.

11. A method for enhancing the arc-tracking and arc-erosion resistance properties of an article, comprising incorporating an effective amount of the composition of claim 1 into said article.

12. The composition of claim 1, wherein the platinum of constituent A1, B1, or C1 comprises catalytic platinum contained in the polyorganosiloxane composition.

13. The method of claim 5, wherein the vinyl groups are carried by the M, D, and/or T units.

14. The method of claim 2, wherein the polyorganosiloxane composition D further comprises one or more compounds comprising: reinforcing, semi-reinforcing, or bulking fillers; fillers serving to modify the rheology of the curable compositions; crosslinking agents; adhesion promoters; plasticizers; catalysts; inhibitors; or colorants.

15. The composition of claim 1, wherein the polyorganosiloxane composition D is in the form of a silicone elastomer comprising crosslinked alkenylsilyl group-carrying and hydroalkenyl group-carrying constituents.

16. A composition for enhancing the arc-tracking and arc-erosion resistance properties of an article comprising:

an effective amount of a mixture A, B or C formed from:

in regard to mixture A, constituents A1 + A3 where constituent A1 is platinum in the form of a platinum complex or compound and constituent A3 consists of a combination of FeO and Fe₂O₃;

in regard to mixture B, mixture B consisting of at least one of: constituents B1 + B2 where constituent B1 has the meaning of constituent A1 and constituent B2 comprises cerium (IV) oxide and/or hydroxide; and

constituents B1 + B3 where constituent B1 has the meaning of constituent A1 and constituent B3 has the meaning of a combination of cerium (IV) oxide and/or hydroxide and titanium oxide TiO₂; or

in regard to mixture C, constituents C1 + C2 where constituent C1 has the meaning of constituent A1 and constituent C2 consists of a combination of constituent B3 and constituent A3;

in constituent A3, the ratio of the amount by weight of FeO to that of Fe_2O_3 lies within the range going from 0.1:1 to 9:1;

in constituent B3, the ratio of the amount by weight of cerium (IV) oxide and/or hydroxide to that of TiO_2 lies within the range going from 0.6:1 to 6:1;

in constituent C2, the ratio of the amount by weight of constituent A3 to that of constituent B3 lies within the range going from 0.02:1 to 1:1;

in a polyorganosiloxane composition D comprising a one-component or two component composition crosslinkable at room temperature or with heat from polyaddition reactions, the composition (D) comprises:

(a) 100 parts by weight of at least one polydiorganosiloxane comprising linear homopolymers or copolymers having at least 2 vinyl groups per molecule, these vinyl groups being linked to different silicon atoms and located in the chain and/or at the chain ends, the other organic radicals of which, linked to the silicon atoms, are chosen from methyl, ethyl and phenyl radicals, at least 60 mol% of these other radicals being methyl radicals, and having a viscosity ranging from 400 to 100,000 mPa.s at 25°C;

(b) at least one polyorganohydrosiloxane chosen from linear or cyclic homopolymers and copolymers having at least 2 hydrogen atoms per molecule, these hydrogen atoms being linked to different silicon atoms and the organic radicals of which, linked to the silicon atoms, are chosen from methyl, ethyl and phenyl radicals, at least 60 mol% of these radicals being methyl radicals, and having a viscosity ranging from 5 to 1000 mPa.s at 25°C, reactant (b) being used in an amount such that the molar ratio of the hydride functional groups of (b) to the vinyl groups of (a) is between 1.1 and 4;

(c) a catalytically effective amount of a platinum catalyst;

(d) 0 to 120 part(s) by weight of siliceous filler(s) per 100 parts by weight of the combination of polyorganosiloxanes (a) + (b); and

the amounts of the various constituents A1, A3, B1, B2, B3, C1 and C2 lie within the ranges mentioned below;

the amount of platinum, expressed in parts by weight of elemental platinum, lies within the range going from 1 to 250 ppm with respect to the total weight of the polyorganosiloxane constituent(s) of the curable compositions D; and the amounts of constituents A3, B2, B3 and C2 of mixtures A, B and C, expressed in parts by weight of the constituent, lie within the range going from 0.5 to 30 parts by weight per 100 parts of the polyorganosiloxane constituent(s) of the curable compositions D.

17. A method of enhancing the arc-tracking and arc-erosion resistance properties of an article, comprising incorporating an effective amount of the composition of claim 16 into said article.

18. A composition for enhancing the arc-tracking and arc-erosion resistance properties of an article comprising:

an effective amount of a mixture A, B or C formed from:

in regard to mixture A, constituents A1 + A3 where constituent A1 is platinum in the form of a platinum complex or compound and constituent A3 consists of a combination of FeO and Fe₂O₃;

in regard to mixture B, mixture B consisting of at least one of: constituents B1 + B2 where constituent B1 has the meaning of constituent A1 and constituent B2 comprises cerium (IV) oxide and/or hydroxide; and

constituents B1 + B3 where constituent B1 has the meaning of constituent A1 and constituent B3 has the meaning of a combination of cerium (IV) oxide and/or hydroxide and titanium oxide TiO₂; or

in regard to mixture C, constituents C1 + C2 where constituent C1 has the meaning of constituent A1 and constituent C2 consists of a combination of constituent B3 and constituent A3;

in constituent A3, the ratio of the amount by weight of FeO to that of Fe₂O₃ lies within the range going from 0.1:1 to 9:1;

in constituent B3, the ratio of the amount by weight of cerium (IV) oxide and/or hydroxide to that of TiO₂ lies within the range going from 0.6:1 to 6:1;

in constituent C2, the ratio of the amount by weight of constituent A3 to that of constituent B3 lies within the range going from 0.02:1 to 1:1;

in a polyorganosiloxane composition D comprising a one-component or two component composition crosslinkable with heat from polyaddition reactions, the composition (D) comprises:

(a) 100 parts by weight of at least one polydiorganosiloxane comprising linear homopolymers or copolymers having at least 2 vinyl groups per molecule, these vinyl groups being linked to different silicon atoms and located in the chain and/or at the chain ends, the other organic radicals of which, linked to the silicon atoms, are chosen from methyl, ethyl and phenyl radicals, at least 60 mol% of these other radicals being methyl radicals, and having a viscosity ranging from 100,000 to 500,000 mPa.s at 25°C;

(b) at least one polyorganohydrosiloxane chosen from linear or cyclic homopolymers and copolymers having at least 2 hydrogen atoms per molecule, these hydrogen atoms being linked to different silicon atoms and the organic radicals of which, linked to the silicon atoms, are chosen from methyl, ethyl and phenyl radicals, at least 60 mol% of these radicals being methyl radicals, and having a viscosity ranging from 5 to 1000 mPa.s at 25°C, reactant (b) being used in an amount such that the molar ratio of the hydride functional groups of (b) to the vinyl groups of (a) is between 1.1 and 4;

(c) a catalytically effective amount of a platinum catalyst;

(d) 0 to 120 part(s) by weight of siliceous filler(s) per 100 parts by weight of the combination of polyorganosiloxanes (a) + (b); and

the amounts of the various constituents A1, A3, B1, B2, B3, C1 and C2 lie within the ranges mentioned below;

the amount of platinum, expressed in parts by weight of elemental platinum, lies within the range going from 1 to 250 ppm with respect to the total weight of the polyorganosiloxane constituent(s) of the curable compositions D; and

the amounts of constituents A3, B2, B3 and C2 of mixtures A, B and C, expressed in parts by weight of the constituent, lie within the range going from 0.5 to 30 parts by weight per 100 parts of the polyorganosiloxane constituent(s) of the curable compositions D.

19. A method of enhancing the arc-tracking and arc-erosion resistance properties of an article, comprising incorporating an effective amount of the composition of claim 18 into said article.

20. A composition for enhancing the arc-tracking and arc-erosion resistance properties of an article comprising:

an effective amount of a mixture A, B or C formed from:

in regard to mixture A, constituents A1 + A3 where constituent A1 is platinum in the form of a platinum complex or compound and constituent A3 consists of a combination of FeO and Fe₂O₃;

in regard to mixture B, mixture B consisting of at least one of: constituents B1 + B2 where constituent B1 has the meaning of constituent A1 and constituent B2 comprises cerium (IV) oxide and/or hydroxide; and

constituents B1 + B3 where constituent B1 has the meaning of constituent A1 and constituent B3 has the meaning of a combination of cerium (IV) oxide and/or hydroxide and titanium oxide TiO₂; or

in regard to mixture C, constituents C1 + C2 where constituent C1 has the meaning of constituent A1 and constituent C2 consists of a combination of constituent B3 and constituent A3;

in constituent A3, the ratio of the amount by weight of FeO to that of Fe₂O₃ lies within the range going from 0.1:1 to 9:1;

in constituent B3, the ratio of the amount by weight of cerium (IV) oxide and/or hydroxide to that of TiO₂ lies within the range going from 0.6:1 to 6:1;

in constituent C2, the ratio of the amount by weight of constituent A3 to that of constituent B3 lies within the range going from 0.02:1 to 1:1;

in a polyorganosiloxane composition D comprising a one-component or two component composition crosslinkable with heat from polyaddition reactions, the composition (D) comprises:

(a') 100 parts by weight of polydiorganosiloxane gum which is a linear homopolymer or copolymer having at least 2 vinyl groups per molecule, these vinyl groups being linked to different silicon atoms and located in the chain and/or at the chain ends, the other organic radicals of which, linked to the silicon atoms, are chosen from methyl, ethyl and phenyl radicals, at least 60 mol% of these other radicals being methyl radicals, and the said gum having a viscosity of greater than 500,000 mPa.s at 25°C;

(b') at least one polyorganohydrosiloxane chosen from linear, cyclic or network homopolymers and copolymers having at least 3 hydrogen atoms per molecule, these hydrogen atoms being linked to different silicon atoms, and the organic radicals of which, linked to the silicon atoms, are chosen from methyl, ethyl and phenyl radicals, at least 60 mol% of these radicals being methyl radicals, and having a viscosity ranging from 5 to 1000 mPa.s at 25°C, reactant (b') being used in an amount such that the molar ratio of the hydride functional groups of (b') to the vinyl groups of (a') is between 0.4 and 10;

(c') a catalytically effective amount of a platinum catalyst;

(d') 0.5 to 120 parts by weight of siliceous filler(s) per 100 parts by weight of the combination of polyorganosiloxanes (a') + (b'); and

the amounts of the various constituents A1, A3, B1, B2, B3, C1 and C2 lie within the ranges mentioned below;

the amount of platinum, expressed in parts by weight of elemental platinum, lies within the range going from 1 to 250 ppm with respect to the total weight of the polyorganosiloxane constituent(s) of the curable compositions D; and

the amounts of constituents A3, B2, B3 and C2 of mixtures A, B and C, expressed in parts by weight of the constituent, lie within the range going from 0.5 to 30 parts by weight per 100 parts of the polyorganosiloxane constituent(s) of the curable compositions D.

21. A method of enhancing the arc-tracking and arc-erosion resistance properties of an article, comprising incorporating an effective amount of the composition of claim 20 into said article.